

[DOCUMENT NAME] CLAIMS

1. A nonaqueous electrolytic lithium secondary cell comprising a room temperature molten salt, an organic solvent, a lithium salt, a positive electrode, a negative electrode and a separator, the secondary cell being characterized in that the room temperature molten salt is an aliphatic quaternary ammonium salt of the formula (1), the lithium salt is represented by the formula (2)

(formula 1)

10 $\text{NR}^1\text{R}^2\text{R}^3\text{R}^4 \text{X}^1$

(formula 2)

LiX^2

(wherein at least one of R^1 to R^4 are each a hydrocarbon group having 1 to 4 carbon atoms and containing an ether group, two of R^1 , R^2 , R^3 and R^4 may bond together to form a ring, and X^1 and X^2 are each a fluorine-containing anion.)

2. A nonaqueous electrolytic lithium secondary cell according to claim 1 wherein the organic solvent contains an organic solvent of the formula A, B or C

20 (formula A)

$\text{R}^5\text{-O-(CO)-O-R}^6$

(formula B)

$\text{R}^7\text{-S-(CS)-S-R}^8$

(formula C)

25 $\text{R}^9\text{-O-(SO)-O-R}^{10}$

(wherein R^5 to R^{10} are each a saturated or unsaturated hydrocarbon group having 1 to 3 carbon atoms, each of R^5 and R^6 , R^7 and R^8 , and R^9 and R^{10} may bond together by a single,

double or triple bond to form a ring.)

3. A nonaqueous electrolytic lithium secondary cell according to claim 1 or 2 wherein the organic solvent contains vinylene carbonate.

5 4. A nonaqueous electrolytic lithium secondary cell according to any of claims 1 to 3 wherein at least one of the fluorine-containing anions X^1 and X^2 contains tetrafluoroborate.

10 5. A nonaqueous electrolytic lithium secondary cell according to any of claims 1 to 4 wherein at least one of the fluorine-containing anions X^1 and X^2 is tetrafluoroborate.

6. A nonaqueous electrolytic lithium secondary cell according to any of claims 1 to 5 wherein at least one of R^1 , R^2 , R^3 and R^4 in the room temperature molten salt of the
15 formula (1) is a group represented by the formula (3)
(formula 3)

$-\text{CH}_2-\text{O}-\text{R}$

(wherein R is alkyl group having 1 to 3 carbon atoms).